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EXAMINER	
TORRES VELAZQUEZ, NORCA LIZ	
ART UNIT	**PAPER NUMBER**
1771	

DATE MAILED: 01/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/015,106	DAVIES ET AL.	
	Examiner	Art Unit	
	Norca L. Torres-Velazquez	1771	

-- The MAILING DATE of this communication appears on the cover sh et with the correspond nce addr ss --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-58 and 60-76* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-58 and 60-76* is/are rejected.

7)☒ Claim(s) *50 and 54* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-58 and 60-76 have been considered but are moot in view of the new ground(s) of rejection.

a. Applicants have amended the claims to include the limitation that the reinforcing fibers are oriented in a generally planar non-overlapping configuration and that the reinforcing structure has a thickness of about 0.004-0.020 inches *(i.e. 0.102- 0.508 mm)*.

b. Applicants argue that the references cited in previous office action fail to teach or suggest a plurality of longitudinal rovings oriented along the longitudinal pull direction.

Claim Objections

2. Claim 50 is objected to because of the following informalities: it claims 0.0004-0.020 inches. The Examiner assumes that this is a typographical error, when it should have been 0.004-0.020 inches. Appropriate correction is required.

3. Claim 54 is objected to because of the following informalities: in line 7, the claim should recite "...so that a portion of the reinforcing fibers..."; instead of "the" for proper antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-10, 13-18, 20, 27, 30-31, 37, 54, 60-65, 67-68 and 71-76 are rejected under 35 U.S.C. 103(a) as being unpatentable over HARAGUCHI et al. (US 5,286,553) in view of CORRONS (WO 98/29242).

HARAGUCHI et al. discloses a composite sheet for a reinforcing material that has excellent moldability and processability. (Column 1, lines 12-18) The reference teaches the use of a bundle of reinforcing filaments that are gathered and unidirectionally paralleled in each of the web-constituting reinforcing filament bundles and the filaments are not entangled with one another. A web having bundles of reinforcing filaments gathered and unidirectionally paralleled are preferably used, because the strength and rigidity can be effectively *imparted in the necessary direction in the molded article* (Column 4, lines 23-37). Therefore, the use of reinforcing filaments extending in a particular direction (such as a transverse direction) is dependent upon the strength and rigidity needs of the molded article. Reinforcing filaments are substantially continuous fibers, for example, a carbon fiber, a glass fiber, an aramid fiber, a silicon carbide fiber, a polybenzothiazole fiber. The reference also teaches that even a thermoplastic polymer filament can be used as the reinforcing filament if the fiber is not substantially melted at the step of heat-melting the thermoplastic polymer fiber and exerts a reinforcing function after cooling and solidification. With regards to the claimed treatment on claim 32, the reference also teaches that to facilitate the impregnation with a melt of the thermoplastic polymer fiber at the heat-melting step for forming a composite, preferably the surfaces of single filaments of the reinforcing filament bundle are coated with a thermoplastic polymer so that the softness is not lost. (Column 4, lines 57-60 and Column 5, lines 3-22). The amount of the reinforcing filament bundle in the composite sheet is 5 to 80% by volume based

on the composite sheet. Among the thermoplastic polymer fiber material used is polyester. (Column 5, lines 44-65) The thermoplastic polymer may be in the form of an alloy, and two or more thermoplastic polymer fiber can be used. (Column 6, lines 1-3) The reference teaches the use of thermoplastic polymer staple fibers having a length no longer than 100 cm [39 inches], preferably no longer than 10 cm [3.9 inches]. (Column 7, lines 7-9) With regards to claims 6 and 7, the reference teaches the use of a staple fiber sheet having a basis weight of 64 g/m^2.

HARAGUCHI et al. further teaches the use of a process in which a thermoplastic polymer staple fiber or filament is deposited or incorporated in the form of single filaments on or in a web containing a reinforcing filament bundle, and a jet of fluid is applied to the assembly to intrude the thermoplastic polymer fiber into the reinforcing filament bundle and entangle and integrate the thermoplastic polymer fiber with the filaments. (Column 8, lines 23-32)

In a preferred embodiment of the HARAGUCHI et al.'s invention, reinforcing filament bundles are unidirectionally paralleled to form a web, and this web is laminated on the thermoplastic staple fiber web. Then the laminate of the thermoplastic staple fiber or filament sheet and the reinforcing filament bundle is subjected to a mechanical process by a jet stream of a fluid. More specifically, at least two sheets of the thermoplastic fibers and at least two webs of the reinforcing filament bundles are laminated (laminated is sometimes carried out by changing the arranging direction of the reinforcing fiber or using different kinds of reinforcing fibers), and the jet stream of a fluid is made to pierce through the laminate in the direction orthogonal to the plane of the sheet, whereby the thermoplastic fiber is embedded in the reinforcing filament bundle web and is entangled and integrated with individual filaments of the reinforcing filament bundle to obtain the intended composite sheet. (Column 8, lines 36-68) It is further noted that

the reference also teaches the use of a TP film or thermosetting resin in combination with the thermoplastic polymer fiber or the surface of the reinforcing filament is coated for improving adhesiveness. (Col. 6, lines 22-29)

It is the Examiner's interpretation that the reinforcing fibers taught by HARAGUCHI et al. read on the presently claimed reinforcing fibers and the thermoplastic polymer staple fiber reads on the presently claimed web of staple fibers.

However, the reference fails to teach the use of rovings in the reinforcing structure.

CORRONS is directed to a complex fabric used in applications such as reinforcing components in plastic molded parts or composite products. The multi-layer fabric (20) is prepared form a chopped glass-fiber strand mat (34), at least one layer of continuous glass-fiber rovings (22, 28, 30, 32). (Abstract) The reference teaches that rovings 24 are aligned in a uni-directional fashion along a longitudinal axis of complex fabric 20. (Page 5, lines 22-23)

With regards to claims 16-17, CORRONS teaches stitch-bonding the layers to form the complex fabric. (Abstract) The sewing threads may be glass fibers, polyamide, polyester or polypropylene material. (Page 7, lines 2-6)

With regards to claim 20, CORRONS teaches that the holes formed in the fabric by the stitching, as well as openings between the chopped glass fibers in the mat, help enhance resin impregnation. (Page 3, lines 13-14)

While the specification shows support for the thickness claimed herein, it does not show that there is some criticality to have a reinforcing structure with such thickness. Therefore, it is the Examiner's position that where the general conditions of a claim are met, mere changes in

size and shape have been held to be within skill of the art dependent only on the desired end use of the article claimed, *In re Rose (105 USPQ 237), In re Dailey (149 USPQ 47).*

Since both references are directed to reinforcing material the purpose disclosed by CORRONS would have been recognized in the pertinent art of HARAGUCHI et al.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the composite sheet of HARAGUCHI et al. and provide with a layer of rovings with the motivation of enhancing the strength along the longitudinal axis of the material as disclosed by CORRONS (page 5, lines 24-25).

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over HARAGUCHI et la. and CORRONS as applied above, and further evidenced by RADVAN et al. (US 4,882,114).

With regards to claim 19, it is noted that the use of binders, such as polyvinyl acetate, are know to be used in the art of reinforcement material. For example, the prior art RADVAN et al. (US 4,882,114), teaches a fiber reinforced material and teaches the use of polyvinyl acetate as a binder. (Refer to claims)

7. Claims 21-25, 28-29, 50-53, 56 and 66 are rejected under 35 U.S.C. 103(a) as being unpatentable over HARAGUCHI et al. in view of CORRONS as disclosed above.

Although the combination of HARAGUCHI et al. and CORRONS does not explicitly teach the claimed permeability, tensile strength, bending resistance of fiber and ratio of a modulus of elasticity it is reasonable to presume that these properties are inherent to reinforcing material of HARAGUCHI et al. when combined with the teachings of CORRONS. Support for said presumption is found in the use of like materials (i.e. unidirectionally paralleled reinforcement filaments, thermoplastic polymer fibers and bonding process). The burden is upon

Applicant to prove otherwise. *In re Fitzgerald* 205 USPQ 594. Reliance upon inherency is not improper even though rejection is based on Section 103 instead of Section 102. *In re Skoner, et al.* (CCPA) 186 USPQ 80

8. Claims 11-12 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over HARAGUCHI et al. and CORRONS and further in view of MARTIN et al. (US 6,080,482).

While HARAGUCHI et al. teaches that the thermoplastic polymer of the polymeric fibers may be in the form of an alloy, and two or more thermoplastic polymer fiber can be used. (Column 6, lines 1-3), it fails to teach the use of bi-component fibers with core-sheath configuration.

MARTIN et al. teaches multicomponent filaments that may be fabricated into filamentary articles or structures or three-dimensional aggregations comprising a plurality of the filaments, which can be in either continuous or staple form. Further, the reference teaches the use of these filaments as reinforcement for plastic matrices. (Column 6, lines 25-67 through Column 7, lines 1-4). In Figures 7-14, the reference shows different configurations of core-sheath fibers. Since both HARAGUCHI et al. and MARTIN et al. are directed to the use of staple fibers as reinforcement, the purpose disclosed by MARTIN et al. would have been recognized in the pertinent art of HARAGUCHI et al.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the polymeric staple fiber layer and provide with a bicomponent fiber with the motivation of providing the reinforcement material with a web layer that is durable without requiring the application of binding agent, or adhesive coating, or solvent

and that can be used for article fabrication once the webs are melt-bonded as disclosed by MARTIN et al. (Column 6, lines 14-18).

9. Claims 34-36, 38-49, 57-58 and 69-70 are rejected under 35 U.S.C. 103(a) as being unpatentable over HARAGUCHI et al. and CORRONS and further in view of VANE (US 5,055,242).

HARAGUCHI et al. fails to teach the claimed transverse direction to which additional reinforcing fibers extend.

VANE discloses a reinforcing material having a plurality of superimposed layers, each layer consisting of a plurality of unidirectional non-woven yarns or threads laid side-by-side, the yarns or threads in at least some of the different layers extending in different directions, the layers are stitched together. (Column 2, lines 14-21). The reference further discloses that the yarns or threads in at least two of the layers are laid so that they extend at 90° to one another. The yarns or threads in at least one further layer are laid so that they extend at an angle of from 45° to 90° with respect to the yarns or threads in at least one the two layers. (Column 2, lines 26-42). The yarns or threads used to produce the reinforcing material may be yarns, threads, roving, tows or the like, of continuous or discontinuous fibers, of glass fiber or other suitable reinforcing material. The yarn of thread used for stitching together the layers may itself be a reinforcing material or a thermoplastic or other material. (Column 2, line 58 through Column 3, lines 1-2) Further, the reference teaches the use of at least one sheet of thermoplastic material interposed between at least two of the reinforcing material layers. (Column 3, lines 20-21)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the reinforcing material and provide it with additional layers of

reinforcing fibers at the presently claimed transverse direction motivated by the desire of providing different strength characteristics in different parts of the reinforcing material as disclosed by VANE (Col. 2, lines 26-57)

10. Claims 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over HARAGUCHI et al. and CORRONS and further in view of BEER et al. (US 5,910,458).

HARAGUCHI et al. fails to teach the use of a surface treatment on the fibers.

On Table I of BEER et al. a sizing composition is disclosed for the mat fiber that includes gamma-aminopropyltriethoxysilane.

Since both HARAGUCHI et al. and BEER et al. are directed to reinforcement materials, the purpose disclosed by BEER et al. would have been recognized in the pertinent art of HARAGUCHI et al.

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the reinforcement material and provide with a coating or sizing treatment with the motivation of providing it with a good "wet-through" and "wet-out" properties as disclosed by BEER et al. (Column 1, lines 29-39).

Double Patenting

12. Claims 1-58 and 60-76 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-47 and 55-66 of copending Application No. 10/015,106 in view of BEALL (US 4,983,453). The present application claims a reinforcing structure adapted for use in the manufacture of a pultruded part, while the reinforcing structure of the copending application claims a pultruded part that comprises the reinforcing structure of the present application, a plurality of rovings oriented

along the longitudinal axis, and a resin matrix substantially surrounding the longitudinal rovings and the reinforcing structure.

BEALL teaches a composite pultruded product that is made with a plurality of longitudinally oriented, essentially parallel glass roving strands in association with a cellulosic mat [which constitutes a reinforcing structure]. The reference further teaches that both the roving strands and the cellulosic mat are completely encased within a resin matrix. (Column 3, lines 26-33)

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the reinforcing material and provide it with longitudinal rovings and encase both the reinforcement and the rovings within a resin matrix with the motivation of producing a pultruding product as disclosed by BEALL. (Abstract).

This is a provisional obviousness-type double patenting rejection.

13, The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 4,752,513 US 5,908,689

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Norca L. Torres-Velazquez whose telephone number is 571-272-1484. The examiner can normally be reached on Monday-Thursday 8:00-4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on 571-272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Norca L. Torres-Velazquez
Examiner
Art Unit 1771

January 19, 2005